Homework to be done by November 12th

Section 7.1: Problems 13, 21, 25, 37, 39, 51 (Note: there is a typo in 51(b). The question should be: *If f has an inverse, what conditions on g will imply that f^{-1} is differentiable?*
Section 7.2: Problems 21, 23, 24, 25.
Section 7.3: Problems 7, 8, 11, 15, 23, 27, 31, 42, 45, 47, 49, 66, 69.
Section 7.4: Problems 11, 19, 23, 27, 37, 41, 42, 56, 69.
Section 7.5: Problems 27, 28, 29, 44, 45, 49.

Problems to be handed in on November 12th

Problem 1. Let f be an increasing function on (a, b). Show that f^{-1} is also increasing on the range of f. (Note: f is not necessarely continuous.)

Problem 2. Assume that f is continuous and one ot one on (a, b). Show that f is either increasing or decreasing.

Problem 3. For $x > 1$, let

$$K(x) = \int_e^x \frac{dt}{\log t}.$$

Show that if a and b are positive constants then the following equalities hold:

3.1
$$\int_e^x \frac{dt}{\log(t+a)} = K(x+a) - K(e+a).$$

3.2
$$\int_e^x \frac{dt}{b+\log t} = e^{-b}\left[K(e^b x) - K(e^{b+1})\right].$$

3.3
$$K(e^x) = \int_1^x \frac{e^t}{t}\, dt.$$